

# Work capability and musculoskeletal symptoms in workers at a public hospital

*Capacidade para o trabalho e sintomas osteomusculares em trabalhadores de um hospital público*

*Capacidad para el trabajo y síntomas osteomusculares en trabajadores de un hospital público*

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**ABSTRACT** | This paper aimed to characterize the sociodemographic profile, identify musculoskeletal complaints and evaluate the work ability of a public hospital workers. This study is quantitative, analytical and cross-sectional, consisted of 31 Hospital das Clínicas' workers, from the School of Medicine, at the University of São Paulo, and the Emergency Unit of Ribeirão Preto, Brazil, which were referred to the physiotherapy service at the Centre for Rehabilitation in the period from May to December 2012. Three questionnaires were administered: the Sociographic Questionnaire, developed by the researchers of this study, the Nordic Musculoskeletal Questionnaire, with socio-demographic intent, which aims to standardize the measurement of reported musculoskeletal symptoms, and the questionnaire Index Capacity for Work, that enables the assessment and early detection of changes in the quality of life of these workers. A total of 31 workers reviews have, on average, 46.5±11.8 years, being 27 women and 4 men. The prevalent occupations were: nursing assistant (19.3 %), auxiliary services (19.3 %) and clerks (16.13%). A number of 74.2 % did not engage in physical activity, 38.7 % have more than 20 years in service and 64.5 % are most of the time standing. The higher prevalence of musculoskeletal complaints was related to the knees, followed by shoulders and lower back. The average Index Capacity for Work was 33.84±8.35, revealing a moderate capacity to work. The presented results indicate the need to evaluate working conditions, based on an ergonomic evaluation consisted of

physical, cognitive and organizational aspects of work, as well as corrective and/or preventive strategy of musculoskeletal injuries and improvements of the capacity to work.

**Keywords** | Musculoskeletal Pain; Work; Physical Therapy Specialty.

**RESUMO** | O objetivo do estudo foi conhecer o perfil sociodemográfico, identificar as queixas osteomusculares e avaliar a capacidade para o trabalho de trabalhadores de um hospital público. Trata-se de um estudo quantitativo, analítico e transversal. Constituiu-se de 31 servidores do Hospital das Clínicas da Faculdade de Medicina de Ribeirão Preto da Universidade de São Paulo e da Unidade de Emergência de Ribeirão Preto, que foram encaminhados ao serviço de Fisioterapia no Centro de Reabilitação no período de maio a dezembro de 2012. Três questionários foram aplicados: o Questionário Sociodemográfico, que foi desenvolvido pelos pesquisadores deste estudo, o Questionário Nórdico de Sintomas Osteomusculares, que visa a padronizar a mensuração de relatos de sintomas osteomusculares, e o questionário Índice de Capacidade para o Trabalho, que possibilita a avaliação e detecção precoce de alterações na qualidade de vida dos trabalhadores. Os 31 avaliados possuem, em média, 46,5±11,8 anos, sendo 27 mulheres e 4 homens. As ocupações mais prevalentes foram: auxiliar de enfermagem (19,3%), auxiliar de serviços (19,3%) e escriturário (16,13%). Um total de 74,2% deles não praticam atividade física, 38,7% possuem mais de 20 anos no serviço

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e 64,5% ficam a maior parte do tempo em pé. A prevalência das queixas osteomusculares tinha relação com os joelhos, seguida das relacionadas aos ombros e lombar. A média do Índice de Capacidade para o trabalho foi de  $33,84 \pm 8,35$ , revelando uma capacidade para o trabalho moderada. Os resultados apresentados apontam a necessidade de avaliação das condições laborais, com base em uma avaliação ergonômica fundada nos aspectos físicos, cognitivos e organizacionais do trabalho, como estratégia corretiva e/ou preventiva das lesões osteomusculares e da melhoria da capacidade de realização do trabalho.

**Descritores** | Dor Musculoesquelética; Trabalho; Fisioterapia.

**RESUMEN** | El objetivo de este estudio fue conocer el perfil sociodemográfico, identificar las quejas osteomusculares y evaluar la capacidad para el trabajo de los trabajadores de un hospital público. Es un estudio cuantitativo, analítico y transversal. 31 servidores del Hospital das Clínicas de la Facultad de Medicina de Ribeirão Preto de la Universidad de São Paulo y de la Unidad de Emergencia de Ribeirão Preto fueron evaluados y encaminados al servicio de Fisioterapia en el Centro de Rehabilitación en el período de mayo a diciembre de 2012. Dos cuestionarios fueron aplicados: el

Cuestionario Nórdico de Síntomas Osteomusculares, de carácter sociodemográfico y desarrollado por los investigadores de este estudio, para la tipificación y mensuración de relatos de los síntomas osteomusculares, y el Cuestionario Índice de Capacidad para el Trabajo, que posibilita la evaluación y detección precoz de alteraciones en la calidad de vida de los trabajadores. Los 31 evaluados tienen, en media,  $46,5 \pm 11,8$  años, siendo 27 mujeres y 4 hombres. Las ocupaciones con mayor prevalencia fueron: auxiliar de enfermería (19,3%), auxiliar de servicios (19,3%) y tesoreros (16,13%). 74,2% no practican actividades físicas, 38,7% tienen más de 20 años en el servicio y 64,5% pasan mucho tiempo de pie. La mayoría de las quejas osteomusculares tenía relación con las rodillas, después con los hombros y lumbar. La media del Índice de Capacidad para el Trabajo fue de  $33,84 \pm 8,35$ , revelando una capacidad para el trabajo moderada. Los resultados presentados muestran la necesidad de la evaluación de las condiciones laborales, basada en una evaluación ergonómica con base en los aspectos físicos, cognitivos y organizacionales, cómo estrategia correctiva y/o preventiva de las lesiones osteomusculares y de la mejoría de la capacidad de realización del trabajo.

**Palabras clave** | Dor Musculoesquelética; Trabajo; Fisioterapia.

## INTRODUCTION

Musculoskeletal complaints from workers have been observed to increase at the various economic sectors in Brazil and in other countries, both developing and developed ones. Musculoskeletal disorders are considered to be an important health care problem, with repercussions to workers and their families, and to society as a consequence<sup>1</sup>.

Several countries experienced situations that are similar to Brazil's over the last few years. In the United States, for example, there is a significant increase in musculoskeletal diseases. According to the United States Bureau of Labor Statistics, there was a 14-fold increase in the number of cases between 1981 and 1994. Another relevant information shows that, in other countries, such as Japan and in Europe, the highest rate of those symptoms relates to the lumbar spine and shoulders<sup>2</sup>, similarly to what is observed in Brazilian studies<sup>21,24</sup>.

Such disorders account for most leaves of absence at work, as well as for the high costs with compensation, treatments, and other processes regarding occupational

rehabilitation both in Brazil and in other industrialized countries<sup>3</sup>.

The workers with musculoskeletal disorders are mostly female young people below 40 years of age who perform activities in various professional fields requiring great effort and implying in repetitive tasks<sup>4,5</sup>. Repetitive tasks, high level of strain, and prolonged postures are mentioned by another study as the main risk factors, causing workers to be prone to musculoskeletal damage<sup>6</sup>.

Musculoskeletal diseases are considered to be concerning health problems by almost all workers, as they can lead to different levels of functional disability<sup>7</sup>. Nonetheless, a class of workers which is often studied and found to suffer from musculoskeletal disorders is the one responsible for hospital work<sup>8</sup>.

Work, in this context, implies the exposure to one or more factors which may lead to diseases or to suffering, a fact which arises from the very nature of the profession and its organization. What the work relates to (pain, suffering, and even death) and the ways through which it is organized (essential and continued) may be harmful to workers<sup>9</sup>.

The hospital environment also has a series of other risks which arise from physical, chemical, psychosocial, and ergonomic factors, and they may be very harmful to that group of workers<sup>10</sup>.

Musculoskeletal disorders often take place at work when the physical demands exceed the workers' physical ability<sup>11</sup>.

The concept of ability for work may be defined as how fit a worker is or will be at a certain moment or in a close future, and how qualified they are to perform their work considering their health status demands, physical and mental capabilities<sup>12</sup>.

Thus, the maintenance of that capability comprises adequate health and working conditions in both interpersonal relationships and the ones regarding the very environment. And that results in better working conditions in and outside the working environment, as well as in higher productivity and more advantageous retirement periods. Besides that, the costs and expenditures with public health care and social security are lower when the working ability is maintained<sup>13</sup>.

This study is based on the previously described premise that a preventive program for work-related diseases in a company must be started with the identification of risk factors, which include organizational, psychosocial, and ergonomic ones, among others<sup>14</sup>.

This way, this study aims, through the application of three questionnaires, to get to know the sociodemographic profiles, identify musculoskeletal complaints, and evaluate the capability for work from the employees of a public hospital who were sent to a physical therapy service, further correlating those variables.

**METHODOLOGY**

The study comprises quantitative, analytical, and cross-sectional research that was conducted at the Rehabilitation Center (CER – Centro de Reabilitação) of Hospital das Clínicas da Faculdade de Medicina de Ribeirão Preto (HCFMRP-USP), and in the Emergency Room (UE – Unidade de Emergência) in the same municipality. It was approved by the Research Ethics Committee of HCRP and FMRP-USP, under HCRP protocol no 5330/2012.

A list containing all workers that were sent to the Physical Therapy Service of HCFMRP-USP from May to December 2012 was requested to CER's physical therapists. Following that, this study researchers

contacted all of them by telephone. Initially, the total number of workers who met the inclusion criteria was 68. However, 37 of them have not taken part of the study, as shown in Figure 1. The inclusion criteria of the sample were the following: having an employment relationship with HCFMRP-USP or with HCFMRP-USP's Fundação de Apoio ao Ensino, Pesquisa e Assistência - FAEPA (Foundation for Support to Teaching, Research and Care); having been clinically diagnosed; having been referred to CER's Physical Therapy Service by an independent physician; having accepted to take part in the research; and having signed a consent form (*termo de consentimento livre e esclarecido* - TCLE). Retired workers or workers already receiving physical therapy treatment were excluded from the sample.

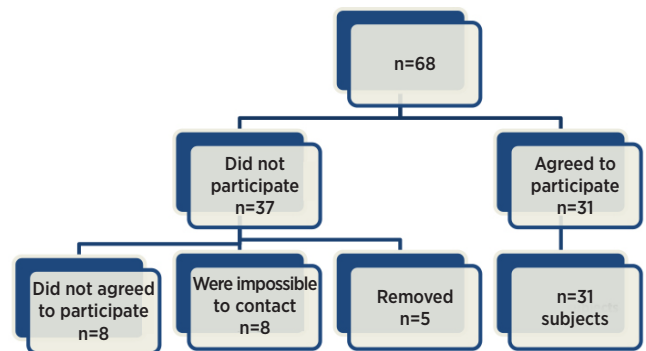


Figure 1. Flowchart of the study subjects

Out of those who have not taken part of the study (n=37), 24 of them could not be contacted; that is, telephone contact was attempted for at least three times in different periods, to which no response was obtained; 8 of them have not accepted to participate in the study, and 5 others were absent from work due to musculoskeletal symptoms. Thus, the total number of subjects in this study was 31, who were divided in the following occupations: six handypersons, six orderlies, five administrative employees, three cooks, two nurses, a psychologist, two department heads, two health care agents, a doorman, an IT technician, one dishwasher, and one surgical instrumentation professional.

Three questionnaires were applied to the participants in the study:

- a) A sociodemographic questionnaire with information regarding: age, weight, height, gender, marital status, schooling, occupation, practice of physical activity, smoking, and use of medications. The questionnaire was developed by the researchers in this study;

b) The *Questionário Nórdico de Sintomas Osteomusculares (QNSO)*<sup>15</sup>, which is the Nordic Musculoskeletal Questionnaire (NMQ)<sup>16</sup> version that was translated and validated into Portuguese, aiming to standardize the measurement of musculoskeletal symptoms, and to thus make the comparison of results from different studies easier. It is very simple and has good reliability indices<sup>17</sup>;

c) The third questionnaire was the *Índice de Capacidade para o Trabalho (ICT)*, which is a public and validated instrument<sup>18</sup> which allows evaluating work ability from a worker's own point of view, and it has 10 questions that are synthesized in 7 dimensions. The results from the seven dimensions supply measures for work ability which range from 7 to 49 points<sup>18</sup>, and they are classified in seven levels: low (7 to 27 points), moderate (28 to 36 points), good (37 to 43 points), and excellent (44 to 49 points)<sup>12</sup>. It is the Brazilian translation of the Work Ability Index (WAI), a questionnaire that was created in Finland. WAI enables the early evaluation and detection of alterations which are important to those workers' quality of life and obtaining information which may guide preventive measures<sup>12</sup>.

The number of required subjects in this study was determined through GraphpadstatMate software,

which showed 95% confidence in an n=30. The number was also based on another article<sup>19</sup> using a total 27 subjects in its study. An initial exploratory analysis of data was conducted in order to correct extreme values or missing cases. Then, descriptive statistics was performed, including prevalence, average and standard deviation, as well as charts in order to improve displaying (distribution and boxplot charts).

## RESULTS

According to the sociodemographic questionnaire, the 31 evaluated workers may be observed to be  $46.56 \pm 11.8$  years of age in average; 27 of them are women and 4 are men, with an average weight of  $73,42 \pm 17.23$  Kg, average height of  $1.62 \pm 0.08$  m, and Body Mass Index (BMI) of  $28.31 \pm 5.77$  kg/m<sup>2</sup>. 54.84% of them are married, 25.8% are single, 16.13% are divorced, and 3.22% are widowed subjects. A total 26.8% subjects finished high school, 22.58% have university degrees, 19.35% have not finished high school, 16.13% of them have not finished their college education, 12.9% subjects finished elementary school, and 3.22% of them have not finished elementary school. The most prevalent occupations were: orderly (19.3%), handyperson (19.3%), and bookkeeper (16.3%). Besides that, 87.09% of subjects reported they did not work elsewhere.

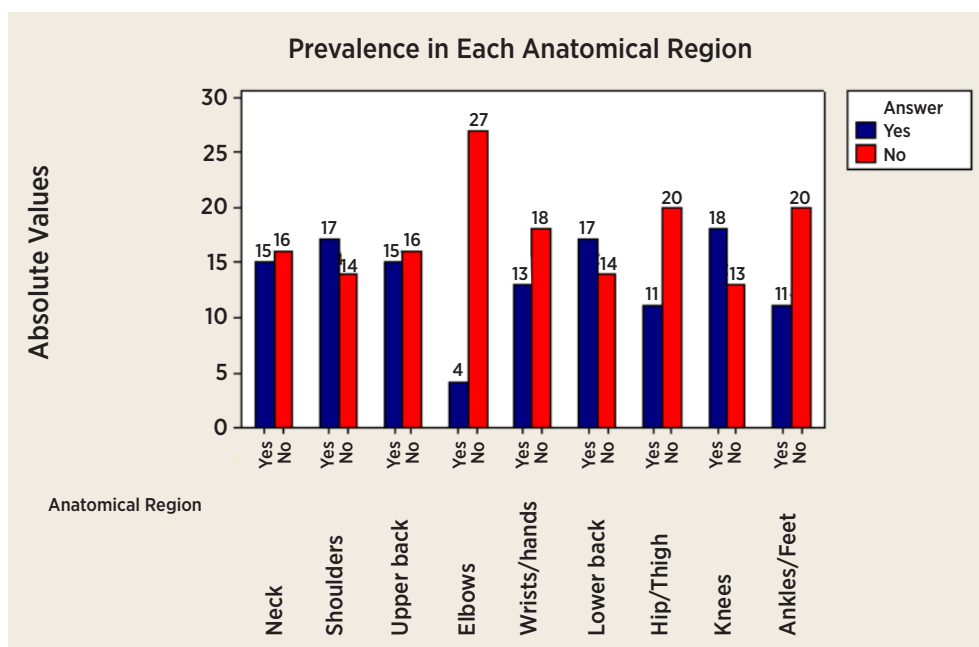


Figure 2. Prevalence of musculoskeletal symptoms reported by region, extracted from the Nordic Musculoskeletal Questionnaire, regarding question 1 (related to the presence of any symptoms such as pain, tingling or numbness in any part of the body in the last 12 months), n=31

A total 74.2 subjects does not practice physical activities, 38.7% have worked for more than 20 years in their company, 64.5% remain standing for most of the time, and 90.32% do not smoke. More than half of the workers (64.51%) used some kind of pain medication over the previous week, and 54.83% of workers have never taken leaves of absence due to the pain they were experiencing.

Figure 2 shows the data that were found in question 1 of NMQ (related to the presence of a symptom like pain, tingling, or numbness in any body region over the

last 12 months). Figure 3 shows the data from question 2 (if symptoms experienced in any body region prevented them from performing their normal duties). Figure 4 brings the data from question 3 of NMQ (whether they have seen a health professional due to their symptoms in any body region). Figure 5, in turn, regards to question 4 of the same questionnaire (whether they had problems in any anatomical region over the last seven days).

The average of ICT was  $33.84 \pm 8.35$ , revealing a moderate work ability (7-27 - low, 28-36 - moderate, 37-43 - moderate, and 44-49 - optimal).

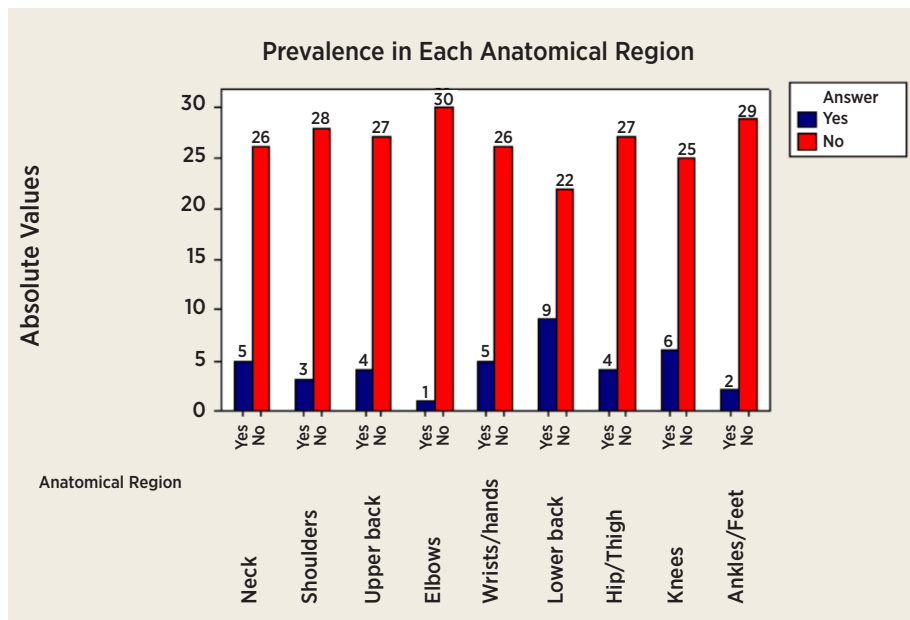


Figure 3. Prevalence of musculoskeletal symptoms reported by region, extracted from Nordic Musculoskeletal Questionnaire, regarding question 2 (if the subject was unable to carry out normal activities due to symptoms in some region of the body), n=31

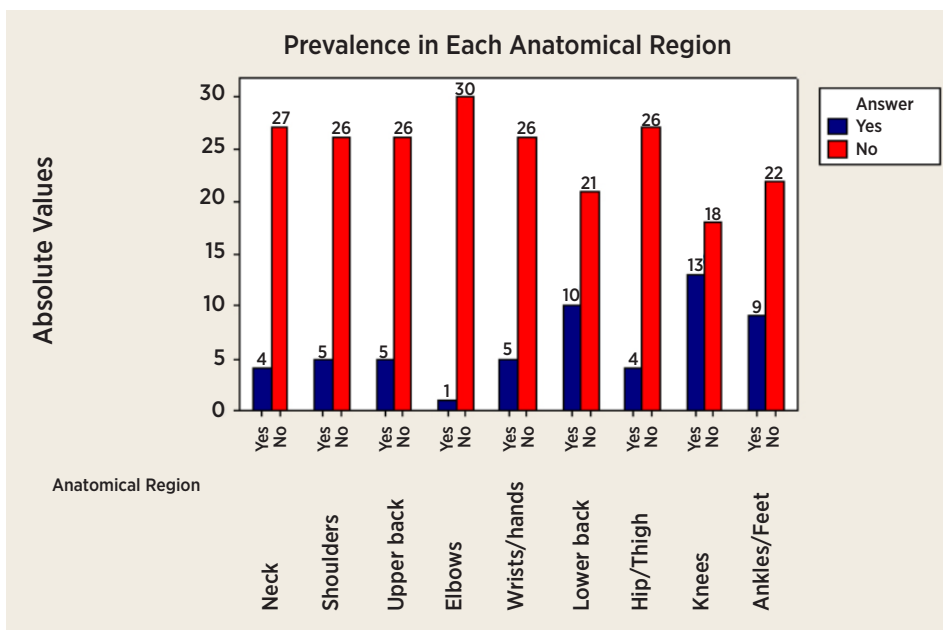


Figure 4. Prevalence of musculoskeletal symptoms reported by region, extracted from Nordic Musculoskeletal Questionnaire, regarding question 3 (if the subject consulted some health professionals due to symptoms in any region of the body), n=31



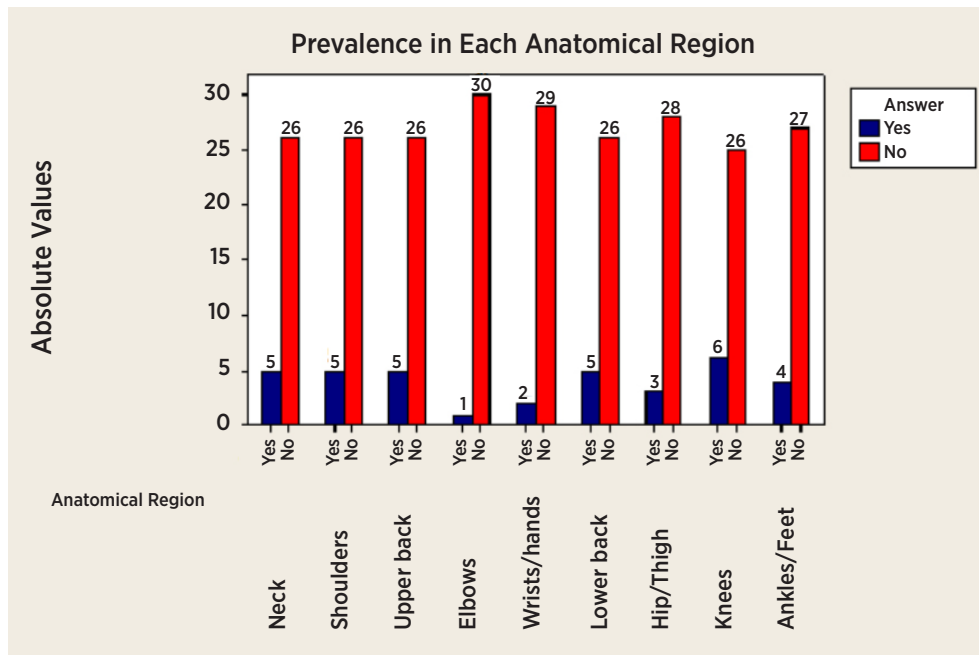


Figure 5. Prevalence of musculoskeletal symptoms reported by region, extracted from Nordic Musculoskeletal Questionnaire, regarding question 4 (if the subject presented had a problem in any anatomical region in the last seven days), n=31

## DISCUSSION

With the obtained results, it was possible to know the musculoskeletal symptoms from the workers at a public hospital in Ribeirão Preto, in 2013. Such results show that the prevalence of musculoskeletal symptoms is very high; that is, 100% of the studied sample mentioned a symptom over the previous 12 months, similar to what was observed in the study by Isosaki et al.<sup>20</sup>.

In regards to genders, the data collection indicated that approximately 87% of analyzed workers are females. Studies with hospital workers display similar results, with 90%<sup>21</sup> and 100%<sup>22</sup> of working women, respectively. It is important to point out that 77.77% of those women also perform household tasks, which are considered to be a second duty period, leading to overwork, physical and mental exhaustion. Those extended working hours may influence their quality of life, whether it is due to implication of the social role that is assumed in families and deep-rooted in Brazilian culture, or due to their roles as spouses, mothers, and housewives<sup>24</sup>. Therefore, women are generally in charge of all activities regarding caring, providing, and supporting. Besides that, they are considered to be more fragile due to their biological and natural characteristics: fertility, motherhood, and menstruation, which make them more susceptible to physical and emotional strain<sup>22</sup>.

In regards to their marital statuses, 54.84% of interviewed people are married, which is similar to the data from Schmidt and Dantas<sup>21</sup> and Gonzales and Carvalho<sup>22</sup>, who found most workers to be formally coexisting as couples (a status that corresponds to common-law marriages).

The most prevalent occupations were: orderly (19.3%), handyperson/janitor (19.3%), and bookkeeper (16.3%). The three occupations were found to have significant differences in regards to tasks involved; nonetheless, the highest prevalence of symptoms was found in the lumbar spine and upper limbs. In the case of orderlies, that is justified by the need to perform activities such as: transference of patients, moving beds, aiding patients to wash themselves<sup>2</sup>; in the case of handypersons/janitors, the activities which may favor the onset of symptoms are: improper postures when carrying heavy objects, repetitive movements, and use of excessive strength<sup>24</sup>. Lastly, the bookkeepers, who have been increasingly using computers in all productive sectors. Those devices generate highly repetitive and quick work routines and inadequate postures<sup>30</sup>.

A large part of the subjects in the study (64.51%) was observed to make use of pain medication in the week prior to the evaluation. Improper self-medication may bring undesirable consequences and effects, leading to iatrogenic illnesses, concealing of

progressive diseases, and diminished pain thresholds. A factor which must be observed is that people with higher school backgrounds, such as nurses and heads of department, were found to have a more frequent tendency to self-medicate. The reasons for that have been assigned to factors such as: higher knowledge on medications, higher economic power, and a higher feeling of autonomy in regards to decisions concerning one's own health<sup>23</sup>. In regards to absenteeism, 54.86% of participants have not taken leaves of absence due to the pain they reported, which suggests that they only seek for medical assistance in more severe situations<sup>20</sup>.

In regards to the anatomical regions where the musculoskeletal symptoms are predominant, this study found that the main ones were the following: knee, shoulders, and lumbar spine. Comparatively, Carregaro et al.<sup>25</sup> showed that health care workers from a non-profit entity mentioned they experienced pain in their lumbar spines more frequently (58%). In turn, Schmidt<sup>21</sup>, when studying nurses from 11 hospitals in Londrina (PR), observed that the highest prevalence of musculoskeletal disorders was found in the lumbar region and shoulders over the previous 12 months.

The high prevalence of pain on the knees and lumbar spine that was observed in this study may be explained by the fact that 64.5% of those workers remain in the standing position for most of the time. Duarte<sup>26</sup> shows that static postures during work require isometric contractions which involve the whole body dimension. Such postures hinder lactic acid metabolism, which ultimately generates and worsens pain. Standing in that position leads to pain, especially in the spine and extremities, and, consequently, to absenteeism<sup>26</sup>.

Pain in those workers' knees and lumbar spines may also be explained by their high body mass indices. The average BMI was 28.31kg/m<sup>2</sup> that was found in this study indicates overweight. Other study<sup>27</sup> involving subjects with high BMIs shows that they are found to have higher prevalence of joint pain as compared to measurements from post-surgical procedures with consequent BMI decrease. Joint pain before surgery was found to be distributed among 55.81% patients with spinal pain and 53.48% with knee pain<sup>27</sup>.

The data on work ability show that 48.4% of interviewed workers were found to have moderate and

low abilities, which corroborates the study by Andrade and Monteiro<sup>28</sup>, in which 46.4% workers who deal with cleaning duties in hospitals fall into that category. A similar study with 368 nurses also revealed that 52% of them were found to have moderate and low work abilities<sup>29</sup>.

Thus, these workers are recommended to have their work abilities restored or improved, in order to promote their health. An effort must be made to foster initiatives aiming to promote that ability (information regarding healthy habits such as adequate nutrition, regular practice of physical exercises, leisure time, resting, social activities, etc).

Based on the premise that the reality at work is more complex than the obtained results, this study should be noted to have limitations. Cross-sectional studies, as they involve self-administered questionnaires, may lead to bias from simultaneous measures and to the possible interference from uncontrolled factors<sup>30</sup>. However, that kind of study enables a reflection on the situation that is observed at the evaluation time, which shows an instant portrait of the studied sample. Besides that, the study was limited to studying the sample in a general way, without analyzing the specific duties of each employee.

From the data that were obtained by this research, it was possible to detect, at an early stage, which workers or work environments require modifications or supporting measures. There is a need for ergonomic assessment based on physical, cognitive and organization aspects of work, in order to assess which risks those workers are continuously exposed to, such as: inadequate furniture, failure to wear personal protective equipment (PPE), maintenance of postures for prolonged periods, failure to take breaks or turns, monotony, lack of treatment and qualification, among others. Besides that, physical therapy is important in guiding stretching procedures for the body parts which are the most used ones at work, in the instruction of (static and dynamic) adequate postures, and in the performance of exercises during work, which may be an important mechanism to prevent musculoskeletal symptoms and fight sedentary lifestyles, depression, anxiety, and to enable improvements in interpersonal relationships. Thus, the necessary conditions to prevent work ability from being reduced and musculoskeletal symptoms from arising in the most susceptible body regions may be created.

## CONCLUSIONS

This study results contribute to broaden the knowledge on the musculoskeletal pain symptoms, and on the work ability from professionals in a public hospital. They are also relevant for a deeper evaluation of their working conditions. Ergonomic assessment that is based on physical, cognitive, and organizational aspects is paramount for the creation of measures to correct and prevent musculoskeletal damage and for the improvement of work ability, with repercussions in the quality of life and in the performance of daily and working activities.

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